

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Express Mail No.: EL627430226US

In re Application of: OOI et al.

**FILING DATE:** Herewith

**ART UNIT:**

**TITLE:** QUANTUM WELL INTERMIXING

**ATTORNEY DOCKET NO.:** 774-010234-US(PAR)

The Commissioner of Patents and Trademarks

Washington, D.C. 20231

**PRELIMINARY AMENDMENT**

Dear Sir:

Please amend the above-identified, enclosed patent application as follows:

**IN THE CLAIMS**

Please amend Claims 5, 8, 9, 10, 13, 15 and 16 as rewritten below:

**CLAIMS**

5. A method according to claim 1, including the step of masking a portion of the structure to control the degree of radiation damage.

8. A method according to claim 5, in which the mask is selected from a group consisting of binary masks, phase masks, gray masks, dielectric or metal masks, and photoresist masks.

9. A method according to claim 1, in which spatial control of intermixing is controlled using a variable profile mask pattern.

10. A method according to claim 1 further comprising the steps of forming a photoresist on the structure and differentially exposing regions of the photoresist in a spatially selective manner in dependence on the degree of quantum well intermixing required, and subsequently developing the photoresist.

13. A method according to claim 10, in which the photoresist is applied to a masking layer.

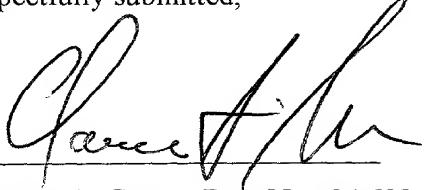
15. A method according to claim 13, further comprising the step of etching the structure with the developed photoresist in situ to provide a differentially etched masking layer.

16. A method according to claim 1, in which an electron cyclotron resonance system is used to generate a plasma, wherein the microwave power of the ECR system is between 300 and 3000 W, more preferably between 1000 and 2000 W, the process temperature is between 25 and 500° C, more preferably between 25 and 200° C, the process pressure is between 0.1 and 100 mTorr, more preferably between 20 and 50 mTorr, and the exposure time is between 30 seconds and 1 hour, more preferably between 4 and 14 minutes.

## REMARKS

In accordance with 37 C.F.R. §1.121 (as amended on 11/7/2000) the rewritten claim(s) above are shown on separate page(s) marked up to show all the changes relative to the previous version of that section.

Respectfully submitted,



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Date

## Application entitled: QUANTUM WELL INTERMIXING

## MARKED UP CLAIM(S)

## CLAIMS

5. A method according to ~~any preceding claim~~<sup>claim 1</sup>, including the step of masking a portion of the structure to control the degree of radiation damage.

8. A method according to ~~any of claims 5 to 7~~<sup>claim 5</sup>, in which the mask is selected from a group consisting of binary masks, phase masks, gray masks, dielectric or metal masks, and photoresist masks.

9. A method according to ~~any preceding claim~~<sup>claim 1</sup>, in which spatial control of intermixing is controlled using a variable profile mask pattern.

10. A method according to ~~any preceding claim~~<sup>claim 1</sup> further comprising the steps of forming a photoresist on the structure and differentially exposing regions of the photoresist in a spatially selective manner in dependence on the degree of quantum well intermixing required, and subsequently developing the photoresist.

13. A method according to ~~any of claims 10 to 12~~<sup>claim 10</sup>, in which the photoresist is applied to a masking layer.

15. A method according to claims 13 or 14, further comprising the step of etching the structure with the developed photoresist in situ to provide a differentially etched masking layer.

16. A method according to ~~any preceding claim~~<sup>claim 1</sup>, in which an electron cyclotron resonance system is used to generate a plasma, wherein the microwave power of the ECR system is between 300 and 3000 W, more preferably between 1000 and 2000 W, the process temperature is between 25 and 500° C, more preferably between 25 and 200° C, the process pressure is between 0.1 and 100 mTorr, more

preferably between 20 and 50 mTorr, and the exposure time is between 30 seconds and 1 hour, more preferably between 4 and 14 minutes.